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ARMY ENVIRONMENTAL HYGIENE AGENCY ABERDEEN PROVING GR--ETC F/6 6/20
TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENT--ETC(U)

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**UNITED STATES ARMY
ENVIRONMENTAL HYGIENE
AGENCY**

ABERDEEN PROVING GROUND, MD 21010

AD A088302

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TOPICAL HAZARD EVALUATION PROGRAM OF
CANDIDATE INSECT REPELLENTS STUDY NOS.
75-51-0025-80, 75-51-0036-80 thru 75-51-0038-80,
75-51-0043-80, 75-51-0044-80, 75-51-0048-80 thru
75-51-0055-80, 75-51-0065-80, 75-51-0076-80,
75-51-0077-80, 75-51-0085-80, 75-51-0100-80, 75-51-0117-80,
75-51-0119-80, 75-51-0120-80, 75-51-0123-80,
75-51-0127-80, 75-51-0128-80, 75-51-0172-80 thru
75-51-0176-80, 75-51-0197-80 thru 75-51-0202-80,
75-51-0204-80, 75-51-0205-80, 75-51-0907-80
MAY 1976 - APRIL 1980.

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DEPARTMENT OF THE ARMY CPT Singer/ldr/AUTOVON
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY 584-3980
ABERDEEN PROVING GROUND, MARYLAND 21010

30 JUL 1980

HSE-LT/WP

SUBJECT: Topical Hazard Evaluation Program of Candidate Insect Repellents
Study Nos. 75-51-0025-80, 75-51-0036-80 thru 75-51-0038-80,
75-51-0043-80, 75-51-0044-80, 75-51-0048-80 thru 75-51-0055-80,
75-51-0065-80, 75-51-0076-80, 75-51-0077-80, 75-51-0085-80,
75-51-0100-80, 75-51-0117-80, 75-51-0119-80, 75-51-0120-80,
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75-51-0176-80, 75-51-0197-80 thru 75-51-0202-80, 75-51-0204-80 thru
75-51-0205-80, 75-51-0907-80, May 1976 - April 1980

Executive Secretary
Armed Forces Pest Management Board
Forest Glen Section, WRAMC
Washington, DC 20012

A summary of the pertinent findings and recommendations of the inclosed report follows:

Preliminary hazard evaluations of the above candidate repellent compounds were performed by means of laboratory animal studies using rats, rabbits and guinea pigs. Compounds AI3-70771, 37393a, 37395a, 37417a, 37414a, 37430a, 37468a, 3747c, 37500, and 37487a caused moderate to severe eye irritations, and were not approved for further testing. Compounds AI3-37428a, 37485a, 26661c, 37461a, 37488a, 37494a, 37505a, 37507a, and 37510a caused moderate to severe primary skin irritations, and also were not approved for further testing. Additionally, compounds AI3-37173a, 37175a, 37412a, 37422a, and 37431a caused a phototoxic reaction, and were rejected for further study. The following compounds were judged sufficiently nontoxic to be approved for further study as candidate repellents: AI3-36580, 70735aGa, 20873cGc, 30005aGc, 36312Gb, 70772, 37171a, 37172a, 37178a, 37191a, 37184a, 37187a, 37035a, 37133a, and 37415a.

FOR THE COMMANDER:

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Preliminary hazard evaluations of the above candidate repellent compounds were performed by means of laboratory animal studies using rats, rabbits and guinea pigs. Compounds AI3-70771, 37393a, 37395a, 37417a, 37414a, 37430a, 37468a, 37476, 37500, and 37487a caused moderate to severe eye irritations, and were not approved for further testing. Compounds AI3-37428a, 37485a, 26661c, 37461a, 37488a, 37494a, 37505a, 37507a, and 37510a caused moderate to severe primary skin irritations, and also were not approved for further testing. Additionally, compounds AI3-37173a, 37175a, 37412a, 37422a, and 37431a caused a phototoxic		

Item 19. KEY WORDS (continued).

AI3-37171a	AI3-37187a	Eye Irritation
AI3-37172a	AI3-37035a	Phototoxic
AI3-37178a	AI3-37133a	Topical Hazard Evaluation Program
AI3-37181a	AI3-37415a	Candidate Repellent
AI3-37184a	Skin Irritation	

Item 20. ABSTRACT (continued).

reaction, and were rejected for further study. The following compounds were judged sufficiently nontoxic to be approved for further study as candidate repellents: AI3-36580, 70735aGa, 20873cGc, 30005aGc, 36312Gb, 70772, 37171a, 37172a, 37178a, 37181a, 37184a, 37187a, 37133a, and 37415a. ←

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DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

TOPICAL HAZARD EVALUATION PROGRAM OF
CANDIDATE INSECT REPELLENTS* STUDY NOS.
75-51-0025-80, 75-51-0036-80 thru 75-51-0038-80,
75-51-0043-80, 75-51-0044-80, 75-51-0048-80 thru
75-51-0055-80, 75-51-0065-80, 75-51-0076-80,
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75-51-0204-80, 75-51-0205-80, 75-51-0907-80
MAY 1976 - APRIL 1980

1. AUTHORITY.

a. Letters, US Department of Agriculture-Agricultural Research Service, Southern Region, Insects Affecting Man Research Laboratory, Gainesville, Florida, dated: 5 May 1976 (AI3-36580); 5 April 1977 (AI3-70735aGa); 1 June 1977 (AI3-20873cGc, 30005aGc, 36312Gb); 15 September 1977 (AI3-70771, 70772); 2 November 1977 (AI3-37171a, 37172a, 37173a, 37175a, 37178a, 37181a, 37184a, 37187a); 4 November 1977 (AI3-37035a); 23 November 1977 (AI3-37393a, 37395a); 9 February 1978 (AI3-37133a); 23 March 1978 (AI3-37417a); 9 August 1978 (AI3-37412a, 37414a, 37415a, 37422a, 37430a, 37431a); 13 October 1978 (AI3-37428a, 37468a, 37476, 37485a, 37500); and 30 November 1978 (AI3-26661c, 37461a, 37487a, 37488a, 37494a, 37505a, 37507a, 37510a).

b. Memorandum of Understanding between the US Army Environmental Hygiene Agency; the US Army Health Services Command; the Department of the Army, Office of The Surgeon General; the Armed Forces Pest Control Board; and the US Department of Agriculture, Agricultural Research, Science and Education Administration; titled, Coordination of Biological and Toxicological Testing of Pesticides, effective 23 January 1979.

2. REFERENCE. Toxicology Division Procedural Guide, US Army Environmental Hygiene Agency (USAEHA), 1976.

3. PURPOSE. The purpose of this program is to provide guidance for further entomological testing of the above (paragraph 1a) candidate insect repellents.

4. SUMMARY OF FINDINGS. Hazard evaluations of the above named candidate repellents were performed by this Agency using New Zealand White rabbits for skin and eye studies, Hartley guinea pigs for skin sensitization studies, and Sprague-Dawley rats for determination of oral toxicity. A tabular presentation of animal toxicity data developed in this Agency follows:†

* See Appendix A for a list of USDA proprietary compounds evaluated in this report.

† In conducting the studies described in this report, the investigators adhered to the "Guide for the Care and Use of Laboratory Animals," US Department of Health, Education and Welfare Publication No. (NIH) 74-23, revised 1978.

‡ The experiments reported herein were performed in animal facilities fully accredited by the American Association for the Accreditation of Laboratory Animal Care.

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Topical Hazard Eval Prog of Candidate Insect Repellents, May 1976-April 1980

TABLE. PRESENTATION OF DATA.*

Study No.	Comp	A13#	Skin	Eye	Results (ref Appendix)		Sensitization	Recommendation	
					ALD (Mg/Kg)	Photo Rxn		Approve	Disapprove
75-51-0907-80	36580		I	A	4300	Negative	Negative	X	
75-51-0025-80	70735aGa		I	B	850	Negative	Negative	X	
75-51-0036-80	20873cGc		I	A	2500	Negative	Negative	X	
75-51-0037-80	30005aGc		I	A	4300	Negative	Negative	X	
75-51-0038-80	36312Gb		I	A	2900	Negative	Negative	X	
75-51-0043-80	70771		II	E					X
75-51-0044-80	70772		I	C	>6500	Negative	Negative	X	
75-51-0048-80	37171a		I	A	4300	Negative	Negative	X	
75-51-0049-80	37172a		I	A	4300	Negative	Negative	X	
75-51-0050-80	37173a		I	A		Positive	Negative		X
75-51-0051-80	37175a		I	A		Positive	Negative		X
75-51-0052-80	37178a		I	A	>4300	Negative	Negative	X	
75-51-0053-80	37181a		I	C	4300	Negative	Negative	X	
75-51-0054-80	37184a		I	C	6400	Negative	Negative	X	
75-51-0055-80	37187a		I	C	2900	Negative	Negative	X	
75-51-0065-80	37035a		II	C	650	Negative	Negative	X	
75-51-0076-80	37393a		I	E					X
75-51-0077-80	37395a		I	E					X
75-51-0100-80	37417a		I	E					X
75-51-0117-80	37412a		II	C		Positive	Moderate		X
75-51-0119-80	37414a		II	E		Negative	Negative		X
75-51-0120-80	37415a		I	C	>1200	Negative	Negative	X	
75-51-0123-80	37422a		II	C		Positive	Slight		X
75-51-0127-80	37430a		I	E		Positive	Negative		X
75-51-0128-80	37431a		I	A			Negative		X
75-51-0172-80	37428a		III	A					X
75-51-0173-80	37468a			F					X
75-51-0174-80	37476			E					X
75-51-0175-80	37485a		IV	C					X
75-51-0176-80	37500			F					X
75-51-0197-80	26661c		IV	A					X
75-51-0198-80	37461a		IV	C					X
75-51-0199-80	37487a			E					X
75-51-0200-80	37488a		IV						X
75-51-0201-80	37494a		IV						X
75-51-0202-80	37505a		III	A					X
75-51-0204-80	37507a		III	A					X
75-51-0205-80	37510a		IV	A					X
75-51-0085-80	37133a		II	C	2900	Negative	Negative	X	

* Refer to Appendix B, Topical Hazard Evaluation Program Definitions of Categories of Compounds Being Considered for Acute Skin Application.

Topical Hazard Eval Prog of Candidate Insect Repellents, May 1976-April 1980

5. CONCLUSION. Ten technical grade compounds (AI3-70771, 37393a, 37395a, 37417a, 37414a, 37430a, 37468a, 37476, 37500, and 37487a) caused moderate to severe corneal and conjunctival eye irritations. Nine technical compounds (AI3-37428a, 37485a, 26661c, 37461a, 37488a, 37494a, 37505a, 37507a, and 37510a) caused moderate to severe primary skin irritations. Five compounds (AI3-37173a, 37175a, 37412a, 37422a, and 37431a) caused a phototoxic response when applied in a 25 percent w/v solution in 95 percent ethanol. None of these compounds qualify as nonhazardous substances.

6. RECOMMENDATIONS. Under the provisions of the Memorandum of Understanding (paragraph 1b), it is recommended that the following USDA proprietary compounds be disapproved for further testing: AI3-70771, 37393a, 37395a, 37417a, 37414a, 37430a, 37468a, 37476, 37500, 37487a, 37428a, 37485a, 26661c, 37461a, 37488a, 37494a, 37505a, 37507a, 37510a, 37173a, 37175a, 37412a, 37422a, and 37431a. The following compounds were determined to be sufficiently nontoxic as tested to be approved for further testing as candidate insect repellents: AI3-36580, 70735aGa, 20873cGc, 30005aGc, 36312Gb, 70772, 37171a, 37172a, 37178a, 37181a, 37184a, 37187a, 37035a, 37133a, and 37415a.

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Topical Hazard Eval Prog of Candidate Insect Repellents, May 1976-April 1980

APPENDIX A

LIST OF USDA PROPRIETARY COMPOUNDS EVALUATED

<u>Compound</u>	<u>Study Number</u>
AI3-70735aGa	75-51-0025-80
AI3-20873cGc	75-51-0036-80
AI3-30005aGc	75-51-0037-80
AI3-36312Gb	75-51-0038-80
AI3-70771	75-51-0043-80
AI3-70772	75-51-0044-80
AI3-37171a	75-51-0048-80
AI3-37172a	75-51-0049-80
AI3-37173a	75-51-0050-80
AI3-37175a	75-51-0051-80
AI3-37178a	75-51-0052-80
AI3-37181a	75-51-0053-80
AI3-37184a	75-51-0054-80
AI3-37187a	75-51-0055-80
AI3-37035a	75-51-0065-80
AI3-37393a	75-51-0076-80
AI3-37395a	75-51-0077-80
AI3-37133a	75-51-0085-80
AI3-37417a	75-51-0100-80
AI3-37412a	75-51-0117-80
AI3-37414a	75-51-0119-80
AI3-37415a	75-51-0120-80
AI3-37422a	75-51-0123-80
AI3-37430a	75-51-0127-80
AI3-37431a	75-51-0128-80
AI3-37428a	75-51-0172-80
AI3-37468a	75-51-0173-80
AI3-37476	75-51-0174-80
AI3-37485	75-51-0175-80
AI3-37500	75-51-0176-80
AI3-26661c	75-51-0197-80
AI3-37461a	75-51-0198-80
AI3-37487a	75-51-0199-80
AI3-37488a	75-51-0200-80
AI3-37494a	75-51-0201-80
AI3-37505a	75-51-0202-80
AI3-37507a	75-51-0204-80
AI3-37510a	75-51-0205-80
AI3-36580	75-51-0907-80

APPENDIX B

TOPICAL HAZARD EVALUATION PROGRAM
DEFINITIONS OF CATEGORIES OF COMPOUNDS BEING
CONSIDERED FOR ACUTE SKIN APPLICATION

CATEGORY I - Compounds producing no primary irritation of the intact skin or no greater than mild primary irritation of the skin surrounding an abrasion. (INTERPRETATION: No restriction for acute application to the human skin.)

CATEGORY II - Compounds producing mild primary irritation of the intact skin and the skin surrounding an abrasion. (INTERPRETATION: Should be used only on human skin found by examination to have no abrasions or may be used as a clothing impregnant.)

CATEGORY III - Compounds producing moderate primary irritation of the intact skin and the skin surrounding an abrasion. (INTERPRETATION: Should not be used directly on the skin without a prophetic patch test having been conducted on humans to determine irritation potential to human skin. May be used without patch testing, with extreme caution, as clothing impregnants. Compound should be resubmitted in the form and at the intended use concentration so that its irritation potential can be reexamined using other test techniques on animals.)

CATEGORY IV - Compounds producing moderate to severe primary irritation of the intact skin and of the skin surrounding an abrasion and, in addition, producing necrosis, vesiculation, and/or eschars. (INTERPRETATION: Should be resubmitted for testing in the form and at the intended use concentration. Upon resubmission, its irritation potential will be reexamined using other test techniques on animals, prior to possible prophetic patch testing in humans, at concentrations which have been shown not to produce primary irritation in animals.)

CATEGORY V - Compounds impossible to classify because of staining of the skin or other masking effects owing to physical properties of the compound. (INTERPRETATION: Not suitable for use on humans.)

EYE CATEGORIES:

A. Compounds noninjurious to the eye. INTERPRETATION: Irritation of human eyes is not expected if the compound should accidentally get into the eyes, provided it is washed out as soon as possible.

B. Compounds producing mild injury to the cornea. INTERPRETATION: Should be used with caution around the eyes.

C. Compounds producing mild injury to the cornea, and in addition some injury to the conjunctiva. INTERPRETATION: Should be used with caution around the eyes and mucosa.

D. Compounds producing moderate injury to the cornea. INTERPRETATION: Should be used with extreme caution around the eyes.

E. Compounds producing moderate injury to the cornea, and in addition producing some injury to the conjunctiva. INTERPRETATION: Should be used with extreme caution around the eyes and mucosa.

F. Compounds producing severe injury to the cornea and to the conjunctiva. INTERPRETATION: Should be used with extreme caution. It is recommended that use be restricted to areas other than the face.